

Listing of Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (currently amended) A method of noncontact dispensing a conformal coating material onto a surface of a substrate comprising:

providing a positioner supporting a jetting valve comprising a ~~piston~~ valve closure element, a valve seat and a nozzle, the positioner being operable to move the jetting valve;

moving the jetting valve with respect to the substrate; and

while moving the jetting valve, applying droplets of conformal coating material to the surface of the substrate by iteratively

causing the ~~piston~~ valve closure element to engage the valve seat to cut off the flow of coating material through the valve seat, propelling to move toward the nozzle to propel a flow of the conformal coating material through the nozzle with a forward momentum, and

breaking the flow of the conformal coating material from the nozzle by using its forward momentum to form a droplet of the conformal coating material.

2. (currently amended) The method of claim 1 wherein the substrate has an electrical device mounted thereon and the method further comprises:

moving the jetting valve with respect to the substrate; and

while moving the jetting valve, applying droplets of conformal coating material to the surface of the substrate and the device by iteratively

causing the ~~piston~~ valve closure element to engage the valve seat to cut off the flow of coating material through the valve seat, propelling to move toward the nozzle to propel a flow of the conformal coating material through the nozzle with a forward momentum, and

breaking the flow of the conformal coating material from the nozzle
by using its forward momentum to form a droplet of the conformal coating
material.

3. (currently amended) A method of noncontact dispensing a conformal coating
material onto solder contacts on a surface of a substrate comprising:

providing a positioner supporting a jetting valve comprising a ~~piston~~ valve
closure element, a valve seat and a nozzle, the positioner being operable to
move the jetting valve in at least two axes of motion;

moving the jetting valve with respect to the substrate; and

while moving the jetting valve, applying droplets of conformal coating
material to the solder contacts by iteratively

causing the ~~piston~~ valve closure element to engage the valve seat
to cut off the flow of coating material through the valve seat, propelling to move
toward the nozzle to propel a flow of the conformal coating material through the
nozzle with a forward momentum, and

breaking the flow of the conformal coating material from the nozzle
by using its forward momentum to form a droplet of the conformal coating
material.

4. (currently amended) A method of applying a conformal coating material to a
surface, the method comprising:

providing a positioner supporting a jetting valve comprising a ~~piston~~ valve
closure element, a valve seat and a nozzle, the positioner being operable to
move the jetting valve with respect to X, Y and Z axes of motion;

moving the jetting valve with respect to one of the X and Y axes of motion;
and

while moving the jetting valve, creating droplets of the conformal coating
material in a first linear pattern on the surface by iteratively

causing the ~~piston~~ valve closure element to engage the valve seat
to cut off the flow of conformal coating material through the valve seat,
propelling to move toward the nozzle to propel a flow of the conformal
coating material through the nozzle with a forward momentum,
breaking the flow of the conformal coating material from the nozzle
by using its forward momentum to form a droplet of the conformal coating
material, and
applying the droplet of the conformal coating material to the surface
of the substrate.

5. (previously submitted) The method of claim 4 wherein moving the jetting valve further comprises moving the jetting valve in a first angular axis of motion about one of the X, Y and Z axes of motion.

6. (previously submitted) The method of claim 5 further comprising moving the jetting valve in a second angular axis of motion about a different one of the X, Y and Z axes of motion.

7. (currently amended) The method of claim 4 further comprising:

(a) moving the jetting valve through an increment along an other of the X and Y axes of motion;

(b) moving the jetting valve along the one of the X and Y axes of motion; and

(c) while moving the jetting valve, creating droplets of the conformal coating material in a second linear pattern on the substrate contiguous with the first linear pattern by iteratively

causing the piston valve closure element to engage the valve seat to cut off the flow of coating material through the valve seat, propelling to move toward the nozzle to propel a flow of the conformal coating material through the nozzle with a forward momentum,

breaking the flow of the conformal coating material from the nozzle by using its forward momentum to form a droplet of the conformal coating material, and

applying the droplet of the conformal coating material to the surface of the substrate.

8. (original) The method of claim 7 further comprising coating an area on the surface by iterating steps (a) through (c).

9. (original) The method of claim 4 wherein applying the droplet of conformal coating material has a maximum volume of 5 nanoliters.

10. (original) The method of claim 4 further comprising iterating the steps of causing, breaking and applying at a rate of about 100 droplets per second to continuously apply the first linear pattern of conformal coating material to the substrate.

11. (original) The method of claim 4 further comprising applying a droplet to coat a maximum area on the substrate of about $200\ \mu\text{m}^2$.